

Principle of Communication (BEC-28)

Amplitude Modulation

Dr. Dharmendra Kumar

- Assistant Professor
- Department of Electronics and Communication Engineering
- MMM University of Technology, Gorakhpur–273010.
- Email: dkece@mmmut.ac.in



UNIT-1

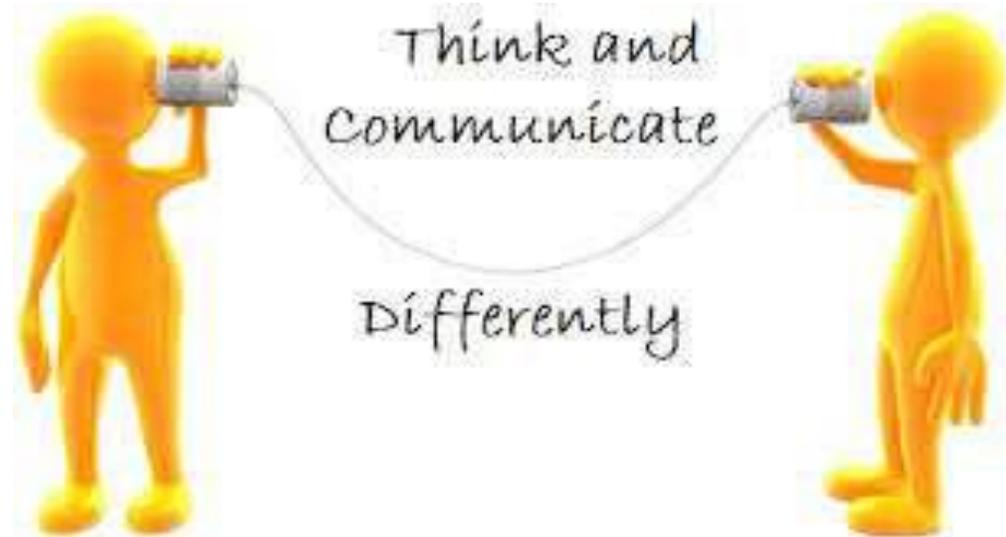
- Overview of Communication system
- Communication channels
- Need for modulation
- Baseband and Pass band signals
- Comparison of various AM systems
- Amplitude Modulation
 - Double side-band with Carrier (DSB-C)
 - Double side-band without Carrier
 - Single Side-band Modulation
 - SSB Modulators and Demodulators
 - Vestigial Side-band (VSB)
 - Quadrature Amplitude Modulator.

Overview of Communication system

- Introduction
- Types of signals
- Basic communication systems
- Modulation
- Need of Modulation
- Communication Channels

INTRODUCTION

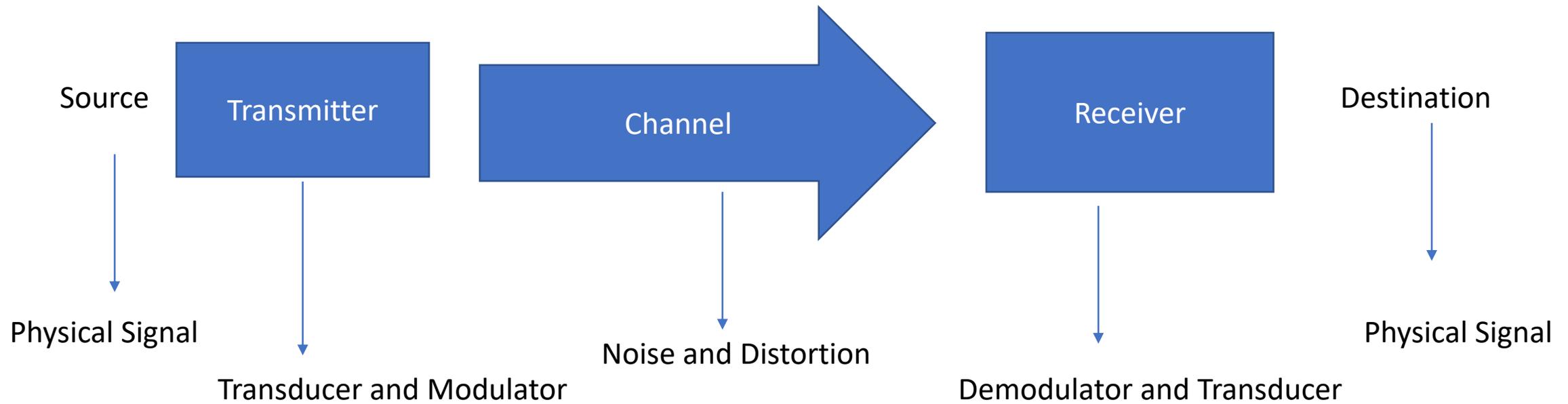
- Communication : A communication system is the process of exchanging information. (i.e. used as conveying thoughts, ideas and feelings to one another.)
- Example: Mobile Communication
Satellite Communication
Cable TV etc.



Types of Signals

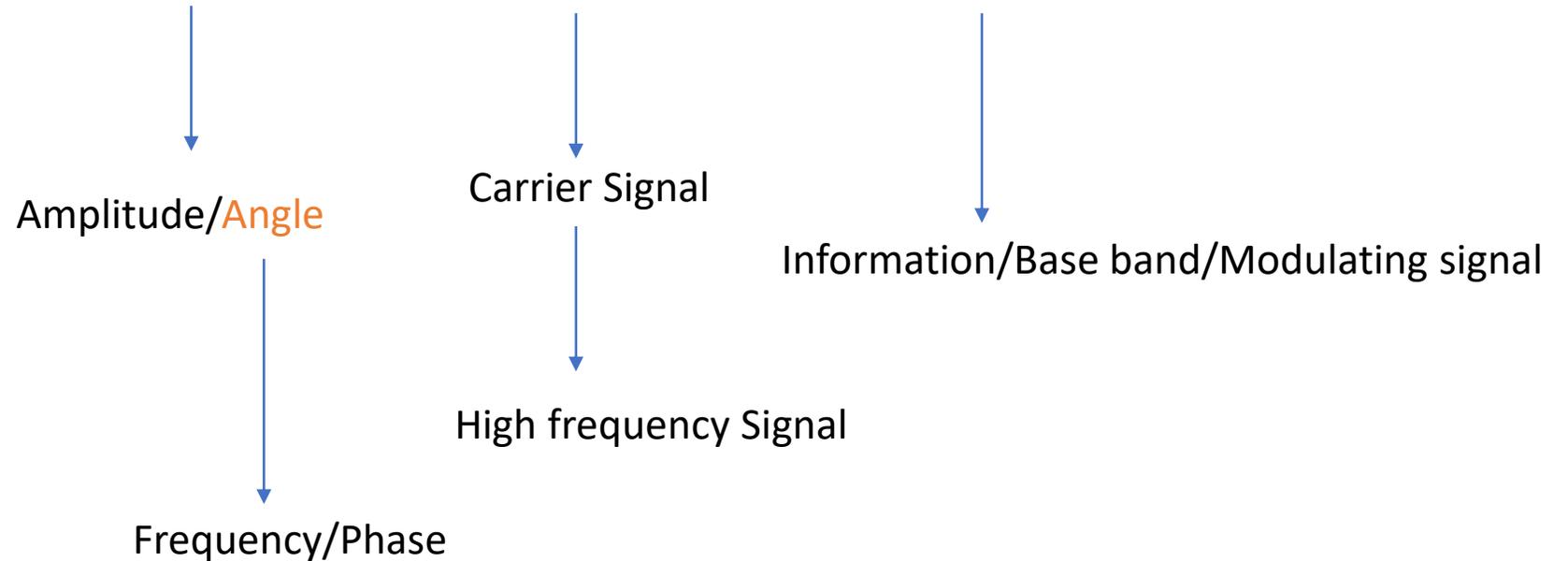
- Analog Signal: Signal magnitude varies in a smooth way without any break with respect to time.
- Digital Signal: Signal magnitude has a constant level for some period of time, then it changes suddenly to another constant level.
- Periodic and Finite energy signals are used for transmission.

Basic Communication System



Modulation

- Process of Varying one **attribute** of a **signal** by **message signal**.



$$c(t) = A_c \cos(2\pi f_c t + \phi)$$

A_c =Amplitude

$2\pi f_c t + \phi$ =Angle

f_c =Frequency

ϕ =Phase

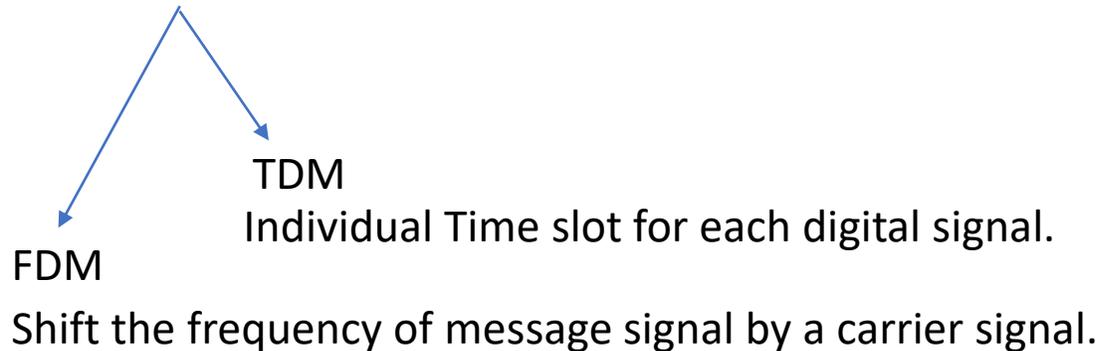
Why Modulation ?

- Reduce Antenna Size (Diameter(d)): $\lambda=c/f$

for, $f = 4 \text{ KHz}$; $d=75000 \text{ m}$

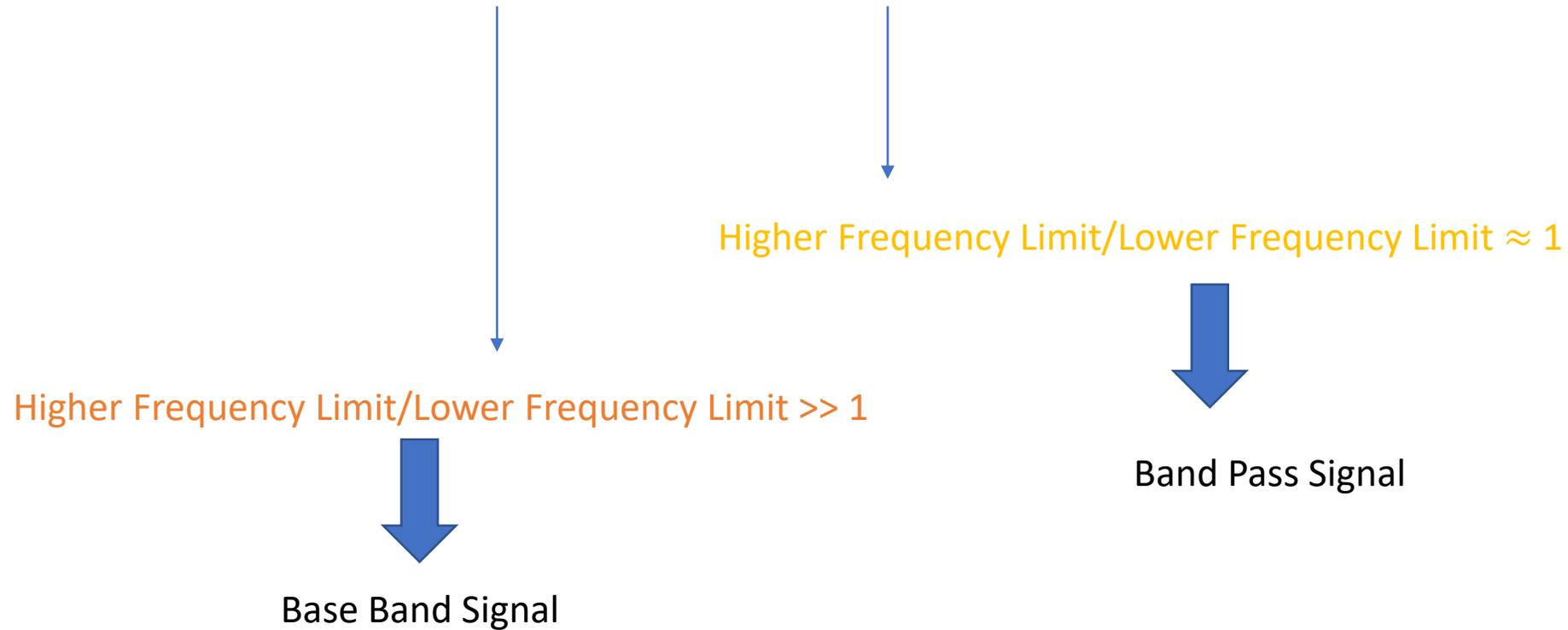
for, $f = 1 \text{ GHz}$; $d=3 \text{ cm}$

- Multiplexing: To avoid interference.



Why Modulation ?....

- Conversion of **wide band** to **narrow band**.



Thank You